

REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 31-47 will be in the application for continued examination subsequent to entry of this Amendment.

In preparing this response counsel reviewed the text of the application as filed and noted instances of improper hyphenation, uses of non-colloquial English and various terms that are no longer in current use, for instance the term "resid" is synonymous with residual oil according to Merriam-Webster Dictionary 2003. The expression "automobile tail gas" has been changed to "automobile exhaust gas". In discussing the background information, various U.S. patents are cited and terms are taken from these patents that may be incorrect. The following patents were consulted: 4,264,336; 4,211,535, 5,118,325 and 4,139,349 and appropriate adjustments made to the description to correspond to the content of the document mentioned. A translation error was noted in the text of the application as filed, namely the expression "saturated or unsaturated fatty acid" was mistranslated and it should be "saturated or unsaturated *aliphatic* acid". This change has been made not only in the specification but the new claims presented above. The error will be apparent to anyone skilled in this art who will understand the intended (correct) term.

Statement Under 37 CFR §1.125 Attached to this response is a substitute specification in clean form and also a copy marked to show changes consistent with Rule 125(c). The specification does not include new matter for the reasons explained above.

In order to advance examination the claims have been revised and replaced with a new claim set. These new claims are based upon the text of the original claims as well as the related passages in the description of the invention, for instance new claims 34-36 and 41-43 find basis in the specification on page 8 continuing to page 9 line 6. New method claim 47 is based on the description of increasing octane and improving anti-knock properties discussed on page 9 of the specification.

In preparing these new claims the examiner's comments in items 1-4 of the Official Action have been taken into account. These new claims are believed to be fully compliant with 35 USC §112, second paragraph. Favorable consideration is requested.

The Official Action includes six separate rejections of alleged anticipation of various combinations of the originally filed claims. Applicants submit that the new claims presented

above are free from these objections as will be apparent from the claims and also considering the remarks and comments that follow.

US 2,851,417 mainly describes an additive for gasoline, namely complex metal salts of organic acids. According to the description, it is a reaction product of an alcoholate of a metal and a hydrocarbon-soluble organic acid under specific conditions. It is in fact a mixture, whose exact chemical structure cannot be definitely known (see column 3, lines 1-11). Therefore, US2,851,417 does not teach the technical aspects of independent claims 31 and 38.

The present invention uses at least one oil-soluble metal salt of organic acid that has a specific chemical structure, in other words, US 2,851,417 and the present invention are directed to different materials and uses.

US 2,935,974 describes "hydrocarbon fuels having improved antiknock properties", in which a lithium salt of a secondary carboxylic acid is added into the fuel oil (especially one already containing a certain amount of tetraethyl lead), so as to achieve the objective of for example improving the antiknock properties of gasoline with the help of an additionally added solution. According to the description, such an objective cannot be achieved by adding the lithium salt of a secondary carboxylic acid alone, therefore, it would be understandable to a person of ordinary skill in the art that the additive described in US 2,935,974 is actually a combination of a solution with the lithium salt of a secondary carboxylic acid, in combination with tetraethyl lead. This is taught in all of its embodiments. As such, the objective of US 2,935,974 cannot be achieved by merely adding the lithium salt of a secondary carboxylic acid by itself into the fuel oil. Moreover, to the extent tetraethyl lead has been forbidden for use in fuel oil by almost all countries of the world, the technical solution of US 2,935,974 cannot currently be implemented.

The additive claimed in the present invention is added directly into hydrocarbon fuel oil, without the need for any solution and not requiring the presence of tetraethyl lead, yet the fuel exhibits improved antiknock properties.

US 3,013,869 discloses a "hydrocarbon-soluble alkali metal composition", which composition consists of lithium salts of an aliphatic branched chain carboxylic acid and carboxylic acids in a certain proportion. The carboxylic acids used are called in this patent the "acid-salt composition". According to the teachings of this patent, when lithium salts of an

aliphatic branched chain carboxylic acid are used as an additive, a certain amount of carboxylic acids have to be mixed therewith as solubilizing agents to enhance the solubility of the lithium salts in the hydrocarbon fuel oil. Therefore, a carboxylic acid is also an indispensable component in the additive of US 3,013,869. Applicants' claims "consist of" the specified oil-soluble metal salt(s) thus a "carboxylic acid" as such is excluded.

Applicants have found that the addition of the carboxylic acid into the fuel oil tends to erode the tank containing the fuel oil, the oil spray nozzle and the engine parts, and oxidation of the acid itself also quickens the oxidation of the fuel oil, reduces the antiknock performance of the additive, and impairs the antiknock properties of the gasoline -- hence it is to be avoided for these reasons.

US 2,097,773 relates to a "stabilized colored gasoline", in which metal fatty acid compounds and metal resin compounds are used to stabilize the coloring function in the gasoline. This patent makes no mention at all as to the use of the alkali metal salt of an organic acid. Also, applicants are concerned with aliphatic acids, not fatty acids (as the original claims mistakenly indicated).

US 5,449,387 discloses certain novel cerium (IV) oxidic compounds, well suited as catalysts, e.g., for the clean combustion of hydrocarbon fuels for the 'drying' of paint compositions. But US 5,449,387 does not describe a combination of the compounds with an alkali metal salt of an organic acid or an alkali-earth metal salt of an organic acid. Further, the additive in its composition does not function the same in a fuel oil as the additive in the present invention.

US 4,568,360 discloses a "mixed organometallic composition" comprising at least a salt of an organic acid from the lanthanide group and a salt of an organic acid from a metal of the Mn or iron group. The amended claims of the present application do not include the aforementioned salt of an organic acid from a metal of the Mn or iron group (note again the "consists of" terminology used in the independent claims). Furthermore, in recent years many countries have unequivocally banned the artificial addition of iron ions and manganese ions into the fuel oil.

In summary, the fuel oil additives claimed in the present application consist of a specific oil-soluble metal salt of an organic acid, with which the properties of a fuel oil can be markedly improved by directly adding the additive thereto. None of the documents cited by the examiner

HU, S.
Appl. No. 10/631,965
June 6, 2006

has entirely disclosed the technical solutions of amended independent claims 31 and 38, and, according to these prior-published teachings, it would not be obvious for a person skilled in the art to predict the advantageous effect brought about by the technical solution of the present invention. As such, independent claims 31 and 38 should be accepted, and the dependent claims should also be accepted.

New claims 43-45 are directed to a fuel oil containing the fuel oil additive according to the present invention. On the basis of the above observations, the technical solutions and the effects of these claims could also not be predicted from the disclosures of U.S. 5,449,387 and U.S. 4,568,360.


All of the U.S. patents identified and discussed in the specification of this application are including in a concurrently filed Information Disclosure Statement (the relevant fee being paid). Please consider this IDS during further review of this application.

For the above reasons it is respectfully submitted that the claims of this application define inventive subject matter. Reconsideration and allowance are solicited.

Respectfully submitted,

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